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INTEGRATED FLAMELESS DISTRIBUTED COMBUSTION/STEAM
REFORMING MEMBRANE REACTOR FOR HYDROGEN PRODUCTION AND USE
THEREOF IN ZERO EMISSIONS HYBRID POWER SYSTEM

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ABSTRACT OF THE DISCLOSURE

Disclosed is a new process and apparatus for steam re-
forming of any vaporizable hydrocarbon to produce H_2 and CO_2 ,
15 with minimal CO, and no CO in the H_2 stream, using a membrane
steam reforming (MSR) reactor and flameless distributed com-
bustion (FDC) which provides great improvements in heat ex-
change efficiency and load following capabilities to drive the
steam reforming reaction. The invention also pertains to a
20 zero emission hybrid power system wherein the produced hydro-
gen is used to power a high-pressure molten carbonate fuel
cell. In addition, the design of the FDC-MSR powered fuel
cell makes it possible to capture good concentrations of CO_2
for sequestration or use in other processes.